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FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER	
ELPENORD, CANDAL	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/553,951	CALCAGNO ET AL.	
	Examiner	Art Unit	
	CANDAL ELPENORD	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *16-35* is/are pending in the application.

4a) Of the above claim(s) *17-35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *21 October 2005, April 29, 2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 17-32 have been considered but are moot in view of the new ground(s) of rejection.

2. Independent claim 17, claim 23, 29 have been amended and claims 33-35 have been added.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 17, 20-21, 31-34** are rejected under 35 U.S.C. 102(e) as being anticipated by Lilja et al (US 6,456,847 B1).

Regarding claim 17, Lilja '847 discloses a radio telephony network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26) supporting at least one link of a radio channel (fig. 3, Radio Transmission Links 314, col. 4, lines 16-32) for a packet data transmission service (Noted: data transmission between the wireless terminals and the base stations, col. 2, lines 27-40), the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4,

lines 26) comprising: a plurality of network controllers (fig. 2, see first and second Radio Network Controllers 306, col. 4, lines 39-49), each network controller (fig. 2 to fig. 3, fig. 4, 4a, see Iub interface connecting the each RNC to a base station, col. 3, lines 61 to col. 4, lines 4) being connected via an interface (fig. 2 to fig. 3, fig. 4, 4a, see Iub interface connecting the each RNC to a base station, col. 3, lines 61 to col. 4, lines 4) to at least one base radio station (fig. 2 to fig. 3, fig. 4, 4a, see Base Station 304, Iub interface connecting the each RNC to a base station, col. 3, lines 61 to col. 4, lines 4) the at least one base radio station (fig. 2 to fig. 3, fig. 4, see Base Station 304, col. 4, lines 27-38) supervising at least one macrocell (fig. 2 to fig. 4, fig. 7a, see first Base station(BTS1) coverage area of a macrocell, col. 7, lines 58-67); and at least one base radio microstation (fig. 2, Radio Subsystem connecting to a radio controller, col. 3, lines 61 to col. 4, lines 4) connected to a network controller (fig. 2, see RNC connecting to radio subsystem) in the plurality of network controllers (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26) via an interface (fig. 2 to fig. 3, fig. 4, 4a, see Base Station 304, Iub interface connecting the each RNC to a base station, col. 3, lines 61 to col. 4, lines 4) the at least one base radio station (fig. 2 to fig. 3, fig. 4, see Base Station 304, col. 4, of the same type as that connecting the at least one base radio station (fig. 2 to fig. 3, fig. 4, see Base Station 304, col. 4, lines 27-38) to the network controllers (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), the said at least one base radio microstation (fig. 7a, BTS2 that services a microcell within the coverage area 700, col. 7, lines 58 to col. 8, lines 7) supervising at least one microcell (fig. 7a, BTS2 that

services a microcell within the coverage area 700, col. 7, lines 58 to col. 8, lines 7) incorporated in the at least one macrocell (see, "microcells 702 situated within the macrocell", col. 7, lines 58-67) and centered at a point different from the point at which the at least one macrocell is centered (fig. 4a, fig. 7a, see microcell situated away from the macrocell), the at least one base radio microstation providing the packet data transmission service in the at least one microcell (fig. 2 to fig. 4a, fig. 7a, see BTS2 that services a microcell 702 within the coverage area 700, col. 7, lines 58 to col. 8, lines 7) on the at least one link of the radio channel (fig. 3, Radio Transmission Links 314, col. 4, lines 16-32), and the at least one base radio station (fig. 2 to fig. 4a, see BTS1) providing the packet data transmission service in areas of the at least one macrocell (fig. 2 to fig. 4a, fig. 7a, see BTS 1 services the macrocell, col. 7, lines 58- to col. 8, lines 4) other than in the at least one microcell (fig. 2 to fig. 4a, fig. 7a, see BTS2 that services a microcell 702 within the coverage area 700, col. 7, lines 58 to col. 8, lines 7).

Regarding claim 20, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein each base radio microstation (fig. 2 to fig. 4a, see BTS1, BTS2 connecting to the respective Mobile Switching Center, col. 4, lines 57 to col. 5, lines 10) comprises a central switch (fig. 2 to fig. 4a, see Mobile Switching Centers, col. 4, lines 57 to col. 5, lines 10) and a plurality of access ports (fig. 2, see Base Station nodes B providing data transmission access to the User Equipment Ue, col. 4, lines 16-26) connected to said central switch (fig. 2 to fig. 4a, see Mobile Switching Centers, col. 4, lines 57 to col. 5, lines 10) by a cable fig. 2 to fig. 4a, see transmission/communication link connecting the radio access

components).

Regarding claim 21, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein each base radio microstation (fig. 2 to fig. 3, fig. 4, 4a, see Base Station 304, Iub interface connecting the each RNC to a base station, col. 3, lines 61 to col. 4, lines 4) comprises a protocol structure (fig. 2 to fig. 4a, , UMTS/UTRAN structure, col. 3, lines 61 to col. 4, lines 4) including a first protocol level (fig. 2 to fig. 4, Radio Subsystem, col. 3, lines 61 to col. 4, lines 4) and a second protocol level (fig. 2 to fig. 4a, see Radio Network controllers controlling the base stations, base station with control entity, col. 4, lines 21-32) located above said first protocol level (fig. 2 to fig. 4, Radio Subsystem, col. 3, lines 61 to col. 4, lines 4), said first protocol level (fig. 2 to fig. 4, Radio Subsystem, col. 3, lines 61 to col. 4, lines 4) being a physical level (fig. 2 to fig. 4, see components of the radio access systems) and said second protocol level being a data transmission level (fig. 2 to fig. 4a, Control Entity for connecting speech and data, col. 4, lines 39-44).

Regarding claim 32, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein said at least one link of said radio channel is a downlink (fig. 4a, fig. 7a, see BTS1 and BST2 services the mobile station on the down link channel using a frequency band, col. 8, lines 1-7).

Regarding claim 33, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein the at least one microcell corresponds to a high traffic area within the at least one macrocell (Noted: microcells placed in areas with a high traffic load, microcell situated within the macrocells, col. 7, lines 58-67).

Regarding claim 34, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein the at least one link of the radio channel comprises at least one downlink (fig. 4a, fig. 7a, see BTS1 and BST2 services the mobile station on the down link channel using a frequency band, col. 8, lines 1-7).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. **Claims 18, 22-23, 24-31, 35** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lilja et al (US 6,456,847 B1) in view of Li et al (US 6,940,827 B2).

Regarding claim 18, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein said at least one base radio microstation (fig. 2 to fig. 3, fig. 4, 4a, see Base Station 304, Iub interface connecting the each RNC to a base station, col. 3, lines 61 to col. 4, lines 4, see Radio Subsystem) provides said packet data transmission service (Noted: data transmission between the wireless terminals and the base stations, col. 2, lines 27-40, (Noted: fig. 4a to fig. 4b, 6a to fig. 6c, see multiple frequency bands being used for data transmission between the base stations and the mobile station terminals, col. 5, lines

15-32, col. 8, lines 17-33).

Regarding claim 22, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein said first protocol level comprises circuit components (fig. 3, Base Station transceiver 308, multiplexer 312, col. 4, lines 27-38, fig. 8 to fig. 9, see modulating and demodulating components).

Regarding claim 23, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein said circuit components (fig. 3, Base Station transceiver 308, multiplexer 312, col. 4, lines 27-38, fig. 8 to fig. 9, see modulating and demodulating components) comprise at least one of dedicated circuits and programmable DSPs (Noted: logic circuits and suitable processor, software, ASIC, col. 9, lines 40-47).

Regarding claim 31, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein said at least one base radio microstation (fig. 2 to fig. 4, , fig. 7a, see BTS2 providing services to mobile station(MS 11 in the microcell 702, col. 8, lines 1-7) can provide said packet data transmission service(Noted: data transmission between the wireless terminals and the base stations, col. 2, lines 27-40) to at least one user equipment (fig. 3, User Equipment 302) located in the microcell served by said base radio microstation (fig. 2 to fig. 4, , fig. 7a, see BTS2 providing services to mobile station(MS 11 in the microcell 702, col. 8, lines 1-7), said user equipment (fig. 2 to fig. 3, see, User

Equipment 302) having a protocol structure including a physical level comprising circuit components (fig. 8, Receiving end with a plurality of components such as Analog to Digital Converter 818b, Demodulator 812b for processing received signals, col. 9, lines 1-17).

Lilja '847 discloses all the claimed limitation with the exception of being silent with respect to claimed features:

Regarding claim 18, the packet data transmission service by using a multi-carrier radio access.

Regarding claim 19, the multi-carrier access is of the OFDM type.

Regarding claim 22, first protocol level comprises circuit components for processing a multi-carrier radio signal, said multi-carrier radio signal being formed from a plurality of radio carriers associated with data to be transmitted.

Regarding claim 23, wherein said circuit components for processing said multi-carrier radio signal comprise at least one dedicated circuits and programmable DSPs.

Regarding claim 24, the data transmission level comprises an access control sub-level including a logical entity for controlling said multi-carrier radio access.

Regarding claim 25, the logical entity maps logical channels on transport channels.

Regarding claim 26, logical entity implements functions of retransmission of incorrectly received data packets.

Regarding claim 27, logical entity implements scheduling functions.

Regarding claim 28, wherein said access control sub-level controlling the transport of said multi-carrier radio signal between said base radio microstation and the network controller connected to it.

Regarding claim 29, wherein each access port comprises said first protocol level including said circuit components for processing said multi-carrier radio signal.

Regarding claim 30, controlling the transport of said multi-carrier radio signal within said network controller or between said network controller and the base radio microstation connected to it.

Regarding claim 31, a protocol structure including a physical level comprising circuit components for demodulating said multi-carrier radio signal.

Regarding claim 35, the network, wherein the at least one downlink supports orthogonal frequency division multiplexing.

However, Li et al (US 6,940,827 B2) in a similar field of endeavor discloses the following features:

Regarding claim 18, the packet data transmission service by using a multi-carrier radio access ("transmitting OFDM signals to subscriber", recited in col. 2, lines 45-50).

Regarding claim 19, the multi-carrier access ("multiple-subscribers of OFDM", recited in col. 3, lines 57-62) is of the OFDM type (fig. 3 and fig. 4, OFDM Transmitter, recited in col. 5, lines 37-49 and "transmitting OFDM signals to subscriber", recited in col. 2, lines 45-50).

Regarding claim 22, first protocol level (fig. 3 and fig. 4 which encompasses physical components) comprises circuit components (fig. 3 and fig. 4, Modulator 404, recited in col. 6, lines 36-58) for processing a multi-carrier radio signal ("processing of n subscribers communications", recited in col. 6, lines 36-58, fig. 3, OFDM Section), said multi-carrier radio signal "OFDM signal", recited in col. 5, lines 59-67) being formed from a plurality of radio carriers ("Use of frequency bands to receive and transmit", recited in col. 5, lines 50-58 and "subcarriers of OFDM", recited in cool. 6, lines 1-20) associated with data to be transmitted (fig. 4, User Data 410, recited in col. 6, lines 47-53).

Regarding claim 23, wherein said circuit components ("processing logic", recited in col. 5, lines 29-360 for processing said multi-carrier radio signal ("process wireless signals in the form of OFDM", recited in col. 5, lines 42-49) comprise dedicated circuits and/or programmable DSPs ("software and dedicated logic", recited in col. 5, lines 29-36).

Regarding claim 24, the data transmission level (fig. 3 and fig. 4, Base Station that uses OFDM Transmitter, recited in col. 6, lines 36-46) comprises an access control sub-level ("Media Access Control/MAC", recited in col. 6, lines 36-46) including a logical entity (fig. 4, MUX as subcarrier allocator", recited in col. 6, lines 47-53) for controlling said multi-carrier radio access ("processing of n subscribers",, recited in col. 6, lines 36-46).

Regarding claim 25, the logical entity ("logical unit", recited in col. 5, lines 8-17) maps logical channels ("mapping of clusters to subcarriers", recited in col. 5, lines 8-17) on transport channels ("subcarriers", recited in col. 5, lines 8-17).

Regarding claim 26, logical entity (fig. 4, MUX 480, recited in col. 6, lines 53-67) implements functions of retransmission (fig. 4, FEC 402, recited in col. 6, lines 53-67) of incorrectly received data packets ("allow the receiver to correct user data", recited in col. 6, lines 53-67).

Regarding claim 27, logical entity (fig. 18, Cluster Allocation and Load Scheduling Controller, recited in col. 17, lines 13-27) implements scheduling functions ("load scheduling of user data", recited in col. 17, lines 13-27).

Regarding claim 28, wherein said access control sub-level ("media access control (MAC) layer", recited in col. 8, lines 1-5) for controlling (fig. 18, Control Admission Controller 1801, recited in col. 17, lines 13-42) the transport ("allocation", recited in col. 17, lines 13-42) of said multi-carrier radio signal ("OFDM signals", recited in col.17, lines 13-42).

Regarding claim 29, wherein each access port (fig. 3, Communication System using OFDM-access points, recited in col. 5, lines 29-48) comprises said first protocol level (fig. 3, OFDM Transmitter or Receiver, recited in col. 5, lines 29-67) including said circuit components (fig. 3 and fig. 4, MUX 480, Modulators 404, IFFT 405 as the circuit components, recited in col. 6-7, lines 36-67 and 1-9) for processing said multi-carrier radio signal ("OFDM signals", recited in col. 5, lines 59-67).

Regarding claim 30, a frame protocol (fig. 3 and fig. 4, OFDM physical devices , recited in col. 5, lines 29-49) or controlling (fig. 18, Control Admission Controller 1801, recited in col. 17, lines 13-42) the transport ("allocation", recited in col. 17, lines 13-42) of said multi-carrier radio signal ("OFDM signals", recited in col.17, lines 13-42).

Regarding claim 31, a protocol structure ("media access control (MAC) layer", recited in col. 8, lines 1-5) including a physical level (fig.3, 4 and 5, Physical Layer devices such as the IFFT 505, recited in col. 7, lines 41-67) comprising circuit components (fig. 5, Demux 507, recited in col. 8, lines 1-5) for demodulating (fig. 5, Demodulator 504, recited in col. 7, lines 58-66) said multi-carrier radio signal ("demodulating of received OFDM signal", recited in col. 41-66).

Regarding claim 35, the network, wherein the at least one downlink supports orthogonal frequency division multiplexing (noted: OFDM down link is used to increase capacity as shown in fig. 3, col. 3, lines 44-50).

In view of the above, having the system for providing data transmission service in several geographical areas served by plurality of base stations of Lilja '847 and the method and apparatus for providing communication services using orthogonal frequency division multiplexing (OFDM) of Li '827, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the features of Lilja '847 by using features as taught by Li 827 in order to provide integrated services between CDMA and OFDM which maximizes the system capacity as suggested in col. 3, lines 38-62 for motivation.

9. **Claims 17, 32**, **33-34** are rejected under 35 U.S.C. 103(a) as being unpatentable over Reetsma et al (US 2002/009998 A1) in view of Lilja et al (US 6,456,847 B1).

Regarding claim 17, Reemtsma et al. discloses, a radio telephony network (fig.2, Radio Communication System 1, recited in paragraph 0033 and paragraph 0001)

supporting at least one link (fig. 1, path 8 A to B, recited in paragraph 0038, lines 1-12) of a radio channel ("radio transmission connection for packet switched data", recited in paragraph 0034, lines 16-23) for a packet data transmission service, the network (fig.2, Radio Communication System 1, recited in paragraph 0033 and paragraph 0001) comprising: a plurality of network controllers (fig. 2, Radio Network Controllers, recited in paragraph 0035, lines 1-7), each network controller (fig. 2, RCN 6, recited in paragraph 0035, lines 1-13) being connected via an interface (fig. 4, "Iur and Iub" as interfaces, recited in paragraph 0046) to at least one base radio station (fig. 2, Radio Base Station 5, NB1, recited in paragraph 0034, lines 1-12) the at least one base radio station (fig. 2, Radio Base Station 5, NB1, recited in paragraph 0034, lines 1-12) supervising at least one macrocell (fig. 1, recited in paragraph 0033 and "large radio cell", recited in paragraphs 0002-0003); and at least one base radio microstation (fig. 1, "at least one base station connected to each radio cell for controlling the set-up of connection", recited in paragraph 0033, paragraph 0034, lines 1-15) connected to a network controller (fig. 2, Radio Network Controller 1, recited in paragraph 0035, lines 1-7) in the plurality of network controllers (fig. 2, Radio Network Controllers, recited in paragraph 0035, lines 1-7) via an interface (fig. 4, "Iur and Iub" as interfaces, recited in paragraph 0046) of the same type as that connecting said base radio station (fig. 2, Radio Base Station 5, NB1, recited in paragraph 0034, lines 1-12) to the network controllers (fig. 2, Radio Network Controllers, recited in paragraph 0035, lines 1-7), the at least one base radio microstation (fig. 1, "at least one base station connected to each radio cell for controlling the set-up of connection", recited in paragraph 0033, paragraph

0034, lines 1-15) supervising at least one microcell (fig. 1, recited in paragraph 0033, " the small radio cells", recited in paragraphs 0002-0003) incorporated in at least one macrocell ("large radio cells 3", recited in paragraph 0033) and centered at a point different from the point at which the at least one macrocell ("large radio cells 3", recited in paragraph 0033) is centered, the at least one base radio microstation (fig. 1, "at least one base station connected to each radio cell for controlling the set-up of connection", recited in paragraph 0033, paragraph 0034, lines 1-15) providing the packet data transmission service ("data transmission via smaller radio cell", recited in paragraph 0013, lines 1-8 and paragraph 0021) in said microcell (fig. 1, recited in paragraph 0033, " the small radio cells", recited in paragraphs 0002-0003) on at least one link of said radio channel ("radio transmission connection for packet switched data", recited in paragraph 0034, lines 16-23).

Regarding claim 32, Reemtsma et al. discloses the network (fig.2, Radio Communication System 1, recited in paragraph 0033 and paragraph 0001), wherein the at least one link of the radio channel ("radio cell", recited in paragraph in paragraph 0019) is a down link (fig. 1 and fig. 4 for downlink, recited in paragraph 0033 and paragraph 0044-base station controls connection set and tear-down- signaling from the base station to user terminal is the downlink, recited in paragraph 0034).

Regarding claim 34, the network (fig.2, Radio Communication System 1, recited in paragraph 0033 and paragraph 0001), wherein the at least one link of the radio channel comprises at least one downlink ("radio cell", recited in paragraph in paragraph 0019) is a down link (fig. 1 and fig. 4 for downlink, recited in paragraph 0033 and

paragraph 0044-base station controls connection set and tear-down- signaling from the base station to user terminal is the downlink, recited in paragraph 0034).

Reemtsma '998 discloses all the claimed limitation with the exception of being silent with respect to claimed features: **regarding claim 17**, the at least one base radio microstation providing the packet data transmission service in the at least one microcell on the at least one link of the radio channel, and the at least one base radio station providing the packet data transmission service in areas of the at least one macrocell other than in the at least one microcell.

Regarding claim 33, the network, wherein the at least one microcell corresponds to a high traffic area within the at least one macrocell.

However, Lilja '847 from the same field of endeavor discloses the above claimed features: the at least one base radio microstation providing the packet data transmission service in the at least one microcell (fig. 2 to fig. 4a, fig. 7a, see BTS2 that services a microcell 702 within the coverage area 700, col. 7, lines 58 to col. 8, lines 7) on the at least one link of the radio channel (fig. 3, Radio Transmission Links 314, col. 4, lines 16-32), and the at least one base radio station (fig. 2 to fig. 4a, see BTS1) providing the packet data transmission service in areas of the at least one macrocell (fig. 2 to fig. 4a, fig. 7a, see BTS 1 services the macrocell, col. 7, lines 58- to col. 8, lines 4) other than in the at least one microcell (fig. 2 to fig. 4a, fig. 7a, see BTS2 that services a microcell 702 within the coverage area 700, col. 7, lines 58 to col. 8, lines 7).

Regarding claim 33, Lilja '847 discloses the network (fig. 2, Radio Access Network consisting of radio controllers, col. 3, lines 61 to col. 4, lines 26), wherein the at

least one link of the radio channel comprises at least one downlink (fig. 4a, fig. 7a, see BTS1 and BST2 services the mobile station on the down link channel using a frequency band, col. 8, lines 1-7).

In view of the above, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the features of Reemtsma '998 by using features as taught by Lilja '847 in order to provide data transmission using different frequency bands to minimize the possibility of interference as suggested in col. 2, lines 27-40.

10. **Claims 18-31, 35** are rejected under 35 U.S.C. 103 (a) as being unpatentable over Reemtsma et al (US 2002/0009998 A1) in view of Lilja et al (US 6,456,847 B1) as applied to claim 17above, and further view of Li et al (US 6,940,827 B2).

Regarding claim 20, Reemtsma et al. discloses the network (fig.2, Radio Communication System 1, recited in paragraph 0033 and paragraph 0001), wherein each base radio microstation (fig. 1, "at least one base station connected to each radio cell for controlling the set-up of connection", recited in paragraph 0033, paragraph 0034, lines 1-15) comprises a central switch ("fig. 4, Common Switching element", recited in paragraph 0045-0046) and a plurality of access ports (fig. 2 and fig. 4, User Terminals 4, recited in paragraph 0034 and paragraph 0045-0046) connected to said central switch by a cable.

Regarding claim 21, Reemtsma et al. discloses the network (fig.2, Radio Communication System 1, recited in paragraph 0033 and paragraph 0001), wherein

each base radio microstation (fig. 1, “at least one base station connected to each radio cell for controlling the set-up of connection”, recited in paragraph 0033, paragraph 0034, lines 1-15) comprises a protocol structure (fig. 1, Network Controller 6, recited in paragraph 0006, lines 1-12 and paragraph 0035, lines 1-8 and "control platform of Radio Network Controller recited in paragraph 0044) including a first protocol level (fig. 4, Auxiliary Subsystem 24 (Processors which are physical devices), recited in paragraph 0045) and a second protocol level (fig. 4, Transport Subsystem 24, recited in paragraph 0045-0046) located above said first protocol level, said first protocol level being a physical level (fig. 4, Auxiliary Subsystem 24 (Processors which are physical devices), recited in paragraph 0045) and said second protocol level (fig. 4, Transport Subsystem 24, recited in paragraph 0045-0046)l being a data transmission level (fig. 4, Transport Subsystem-provides the switching, recited in paragraph 0045-0046).

Regarding claim 28, Reemtsma et al. discloses the network (fig.2, Radio Communication System 1, recited in paragraph 0033 and paragraph 0001) wherein said access control sub-level (fig. 5, MAC layer device, recited in paragraph 0044, lines 1-11) comprises a frame protocol (fig. 4, Control Platform comprises of interfaces and processors", recited in paragraph 0044-0045-“see one of the interfaces as the frame protocol) for controlling (“controlling radio cluster communications”, recited in paragraph 0044-0045) the base radio microstation (fig. 1, “at least one base station connected to each radio cell for controlling the set-up of connection”, recited in paragraph 0033, paragraph 0034, lines 1-15) and the network (fig.2, Radio Communication System 1, recited in paragraph 0033 and paragraph 0001).

regarding claim 29, Reemtsma et al. discloses the network (fig.2, Radio Communication System 1, recited in paragraph 0033 and paragraph 0001), wherein a central switch (fig. 4, “Switching Element that provides access”, recited in paragraph 0045-0046) comprises said logical entity (“MAC”, recited in paragraph 0049, lines 1-11 and paragraph 0016) and said frame protocol (fig. 4, Control Platform comprises of interfaces and processors", recited in paragraph 0044-0045-“see one of the interfaces as the frame protocol) the central switch being connected to a plurality of access ports (fig. 2 and fig. 4, User Terminals 4, recited in paragraphs 0034 and paragraph 0046) and each access port (fig. 2 and fig. 4, User Terminals 4, recited in paragraphs 0034 and paragraph 0046) comprises said first protocol level (fig.4, Transport Subsystem 26 that provides bi-directional transmissions”, recited in paragraph 0045-0046 and “Ethernet Connection 23, recited in paragraph 0044).

Regarding claim 30, the network (fig.2, Radio Communication System 1, recited in paragraph 0033 and paragraph 0001), wherein each network controller (fig. 2, RCN 6, recited in paragraph 0035, lines 1-13) comprises an access control sub-level (“Media Access Control medium/MAC”, recited in paragraph 0049, lines 1-11 and paragraph 0016) and frame protocol (fig. 4, Control Platform comprises of interfaces and processors", recited in paragraph 0044-0045-“see one of the interfaces as the frame protocol) for controlling the transport between the network controller (fig. 2, RCN 6, recited in paragraph 0035, lines 1-13) and the base radio station microstation connected to it (fig. 2, Network Connection).

Regarding claim 31, the network (fig.2, Radio Communication System 1, recited in paragraph 0033 and paragraph 0001), wherein the at least one base radio microstation (fig. 1 and fig. 2, "at least one base station connected to each radio cell for controlling the set-up of connection", recited in paragraph 0033, paragraph 0034, lines 1-15) can provide the packet data transmission service ("packet data transmission or GPRS", recited in paragraph 0034, lines 16-24) to at least one user equipment (fig. 2, User Terminal UE1, recited in paragraph 0034, lines 1-16) in located in the microcell (fig. 1, recited in paragraph 0033, " the small radio cells", recited in paragraphs 0002-0003) served by the bas radio microstation (fig. 1 and fig. 2, "at least one base station connected to each radio cell for controlling the set-up of connection", recited in paragraph 0033, paragraph 0034, lines 1-15).

Reemtsma '998 and Lilja '847 disclose all the claimed limitation all with the exception of being silent with respect to the claimed features:

Regarding claim 18, the packet data transmission service by using a multi-carrier radio access.

Regarding claim 19, the multi-carrier access is of the OFDM type, **regarding claim 20**, the cable.

Regarding claim 22, first protocol level comprises circuit components for processing a multi-carrier radio signal, said multi-carrier radio signal being formed from a plurality of radio carriers associated with data to be transmitted.

Regarding claim 23, wherein said circuit components for processing said multi-carrier radio signal comprise dedicated circuits and/or programmable DSPs.

Regarding claim 24, the data transmission level comprises an access control sub-level including a logical entity for controlling said multi-carrier radio access.

Regarding claim 25, the logical entity maps logical channels on transport channels.

Regarding claim 26, logical entity implements functions of retransmission of incorrectly received data packets.

Regarding claim 27, logical entity implements scheduling functions.

Regarding claim 28, wherein said access control sub-level controlling the transport of said multi-carrier radio signal between said base radio microstation and the network controller connected to it.

Regarding claim 29, wherein each access port comprises said first protocol level including said circuit components for processing said multi-carrier radio signal.

Regarding claim 30, controlling the transport of said multi-carrier radio signal within said network controller or between said network controller and the base radio microstation connected to it.

Regarding claim 31, a protocol structure including a physical level comprising circuit components for demodulating said multi-carrier radio signal.

Regarding claim 35, the network, where the at least one downlink supports orthogonal frequency division multiplexing.

However, '827 from the same field of endeavor discloses above claimed features:

Regarding claim 18, the packet data transmission service by using a multi-carrier radio access ("transmitting OFDM signals to subscriber", recited in col. 2, lines 45-50).

Regarding claim 19, the multi-carrier access ("multiple-subscribers of OFDM", recited in col. 3, lines 57-62) is of the OFDM type (fig. 3 and fig. 4, OFDM Transmitter, recited in col. 5, lines 37-49 and "transmitting OFDM signals to subscriber", recited in col. 2, lines 45-50).

Regarding claim 20, the cable (fig. 4, chains, processing paths, recited in col. 6, lines 36-46).

Regarding claim 22, first protocol level (fig. 3 and fig. 4 which encompasses physical components) comprises circuit components (fig. 3 and fig. 4, Modulator 404, recited in col. 6, lines 36-58) for processing a multi-carrier radio signal ("processing of n subscribers communications", recited in col. 6, lines 36-58, fig. 3, OFDM Section), said multi-carrier radio signal "OFDM signal", recited in col. 5, lines 59-67) being formed from a plurality of radio carriers ("Use of frequency bands to receive and transmit", recited in col. 5, lines 50-58 and "subcarriers of OFDM", recited in cool. 6, lines 1-20) associated with data to be transmitted (fig. 4, User Data 410, recited in col. 6, lines 47-53).

Regarding claim 23, wherein said circuit components ("processing logic", recited in col. 5, lines 29-360 for processing said multi-carrier radio signal ("process wireless signals in the form of OFDM", recited in col. 5, lines 42-49) comprise dedicated circuits and/or programmable DSPs ("software and dedicated logic", recited in col. 5, lines 29-36).

Regarding claim 24, the data transmission level (fig. 3 and fig. 4, Base Station that uses OFDM Transmitter, recited in col. 6, lines 36-46) comprises an access control sub-level ("Media Access Control/MAC", recited in col. 6, lines 36-46) including a logical entity (fig. 4, MUX as subcarrier allocator", recited in col. 6, lines 47-53) for controlling said multi-carrier radio access ("processing of n subscribers",, recited in col. 6, lines 36-46).

Regarding claim 25, the logical entity ("logical unit", recited in col. 5, lines 8-17) maps logical channels ("mapping of clusters to subcarriers", recited in col. 5, lines 8-17) on transport channels ("subcarriers", recited in col. 5, lines 8-17).

Regarding claim 26, logical entity (fig. 4, MUX 480, recited in col. 6, lines 53-67) implements functions of retransmission (fig. 4, FEC 402, recited in col. 6, lines 53-67) of incorrectly received data packets ("allow the receiver to correct user data", recited in col. 6, lines 53-67).

Regarding claim 27, logical entity (fig. 18, Cluster Allocation and Load Scheduling Controller, recited in col. 17, lines 13-27) implements scheduling functions ("load scheduling of user data", recited in col. 17, lines 13-27).

Regarding claim 28, wherein said access control sub-level ("media access control (MAC) layer", recited in col. 8, lines 1-5) for controlling (fig. 18, Control Admission Controller 1801, recited in col. 17, lines 13-42) the transport ("allocation", recited in col. 17, lines 13-42) of said multi-carrier radio signal ("OFDM signals", recited in col.17, lines 13-42).

Regarding claim 29, wherein each access port (fig. 3, Communication System using OFDM-access points, recited in col. 5, lines 29-48) comprises said first protocol level (fig. 3, OFDM Transmitter or Receiver, recited in col. 5, lines 29-67) including said circuit components (fig. 3 and fig. 4, MUX 480, Modulators 404, IFFT 405 as the circuit components, recited in col. 6-7, lines 36-67 and 1-9) for processing said multi-carrier radio signal ("OFDM signals", recited in col. 5, lines 59-67).

Regarding claim 30, a frame protocol (fig. 3 and fig. 4, OFDM physical devices , recited in col. 5, lines 29-49) or controlling (fig. 18, Control Admission Controller 1801, recited in col. 17, lines 13-42) the transport ("allocation", recited in col. 17, lines 13-42) of said multi-carrier radio signal ("OFDM signals", recited in col.17, lines 13-42).

Regarding claim 31, a protocol structure ("media access control (MAC) layer", recited in col. 8, lines 1-5) including a physical level (fig.3, 4 and 5, Physical Layer devices such as the IFFT 505, recited in col. 7, lines 41-67) comprising circuit components (fig. 5, Demux 507, recited in col. 8, lines 1-5) for demodulating (fig. 5, Demodulator 504, recited in col. 7, lines 58-66) said multi-carrier radio signal ("demodulating of received OFDM signal", recited in col. 41-66).

Regarding claim 35, the network, wherein the at least one downlink supports orthogonal frequency division multiplexing (noted: OFDM down link is used to increase capacity as shown in fig. 3, col. 3, lines 44-50).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the features of Reemtsma '998 with Lilja '847 by using features as taught by Li '827 in order to provide integrated services between

CDMA and OFDM which maximizes the system capacity as suggested in col. 3, lines 38-62 for motivation.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ann et al (US 5,870,392), Dent et al (US 7,155,229 B2), Lindquist et al (US 2005/009531 A1), Lind et al (US 6,163,694) and Haberland et al (US 6,983,333 B2) are cited to show methods and system that are related to the claimed invention.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CANDAL ELPENORD whose telephone number is (571)270-3123. The examiner can normally be reached on Monday through Friday 7:30AM to 5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Bin Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Candal Elpenord/
Examiner, Art Unit 2616

/Kwang B. Yao/
Supervisory Patent Examiner, Art Unit 2616